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LAHIVE & COCKFIELD, LLP/THE MATHWORKS
FLOOR 30, SUITE 3000
One Post Office Square
Boston, MA 02109-2127

EXAMINER	
OCHOA, JUAN CARLOS	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/678,718	Applicant(s) GAGE, STACEY M.	
	Examiner JUAN C. OCHOA	**Art Unit** 2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 April 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-5,7-11,13,15-17 and 19-96* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1, 3–5, 7–11, 13, 15–17 and 19–96* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. The amendment filed 4/17/08 has been received and considered. Claims 2, 12, and 14 are canceled. Claims 1, 3–5, 7–11, 13, 15–17, and 19–96 are presented for examination.

Claim Interpretation

2. Office personnel are to give claims their "broadest reasonable interpretation" in light of the supporting disclosure. In re Morris, 127 F.3d 1048, 1054–55, 44 USPQ2d 1023, 1027–28 (Fed. Cir. 1997). Limitations appearing in the specification but not recited in the claim are not read into the claim. In re Prater, 415 F.2d 1393, 1404–05, 162 USPQ 541,550–551(CCPA 1969). See *also In re Zletz, 893 F.2d 319,321–22, 13 USPQ2d 1320, 1322(Fed. Cir. 1989) ("During patent examination the pending claims must be interpreted as broadly as their terms reasonably allow").... The reason is simply that during patent prosecution when claims can be amended, ambiguities should be recognized, scope and breadth of language explored, and clarification imposed.... An essential purpose of patent examination is to fashion claims that are precise, clear, correct, and unambiguous. Only in this way can uncertainties of claim scope be removed, as much as possible, during the administrative process.

3. In the absence of an elaboration of "discrete" in the Application description, the claims reciting "a discrete wind turbulence model" were interpreted according to this dictionary definition (American Heritage® Dictionary of the English Language):

Mathematics Defined for a finite or countable set of values; not continuous.

4. Claims recite "simple variable mass" and “custom variable mass”. The specification defines "simple variable mass" and “custom variable mass” as “The variable mass includes at least one of simple variable mass in which mass changes via mass rate, and a custom variable mass in which users may specify how the mass changes" (see page 4, lines 8–10). The claims reciting "simple variable mass" and “custom variable mass” were interpreted according to this definition.

5. The Examiner would like to point out that the Examiner, throughout the prosecution of this application, applied art in accordance with the guidance set forth in MPEP § 2131, "The elements must be arranged as required by the claim, but this is not an ipsissimis verbis test, i.e., identity of terminology is not required".

Claim Objections

6. Claims 65 and 66 line 2 include the term “implement”, meaning is unclear. Examiner interprets as "models for equations of motion **are implemented** in multiple axes representations" for examination purposes.

7. Appropriate correction is required.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 3–5, 8–11, 15–17, and 20–24 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

10. Claims 3–5 and 8–11 refer to claim 2, and this raises indefiniteness issues. Claims depend from a non-existing claim. Examiner interprets as “The method of claim 1“ for examination purposes.

11. Claims 15–17 and 20–24 refer to claim 14, and this raises indefiniteness issues. Claims depend from a non-existing claim. Examiner interprets as “The method of claim 13“ for examination purposes.

12. Appropriate correction is required.

Claim Rejections – 35 USC § 102

13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

14. Claims 38–41, 54–72, and 80–96 are rejected under 35 U.S.C. 102(a) as being anticipated by AeroSim Blockset User's Guide, (AeroSim hereinafter).

15. As to claim 38, AeroSim discloses a computer implemented system for **designing a target system** (see "AeroSim aeronautical simulation blockset provides a complete set of tools for the rapid **development of** nonlinear 6–degree–of–freedom **aircraft dynamic models**" in page 3, col. 2, last paragraph, lines 1–3) in which a planetary environment is one of the factors for designing the target system, the system

comprising: a model storage for storing and providing models necessary to design the target system (see "library" in page 3, col. 2, last paragraph, lines 1–3); a design unit for designing the target system by utilizing the models provided by the model storage (see page 4, col. 2, last paragraph), and a **memory** for saving a model of the target system (see “The **library** also provides complete aircraft models” in page 4, col. 2, last paragraph); wherein the model storage provides a plurality of wind turbulence models including at least a discrete wind turbulence model (see “discrete” as “3×1 VECTOR”, since AeroSim’s 3×1 vector is not continuous, in "Inputs: VelW = the 3×1 VECTOR of wind–axes velocities" and "Outputs: TurbVel = the 3×1 VECTOR of turbulence velocities" in the same AeroSim page 65).

16. As to claim 39, AeroSim discloses a system further comprising an execution unit for executing the target system designed in the design unit (see page 32, 1st and 2nd paragraphs).

17. As to claim 40, AeroSim discloses a system wherein the execution unit is realized through a process of automatic code generation from the design unit (see page 32, 2nd paragraph).

18. As to claim 41, AeroSim discloses a system wherein numerical representations including data type, precision and data vectorization of the models are automatically derived from the context of using the models when executing the models (see page 32, 4th and 5th paragraphs).

19. As to claim 54, AeroSim discloses a system wherein the models provided from the model storage are represented in symbols (see page 4, Fig. 2).

20. As to claim 55, AeroSim discloses a system wherein the symbols include blocks (see page 3, col. 2, last paragraph, lines 1–3).

21. As to claim 56, AeroSim discloses a system wherein the design unit provides a user interface to enter parameters for each block of the target system in response to an action taken by users (see page 32, 4th paragraph).

22. As to claim 57, AeroSim discloses a system wherein the user interface is provided in response to users clicking each block of the target system (see page 41, 2nd paragraph).

23. As to claim 58, AeroSim discloses a system wherein the user interface provides an option to select one of the wind turbulence models from the model storage (see page 41, 2nd paragraph and “atmosphere” block in Fig. 31, as well as page 62).

24. As to claim 59, AeroSim discloses a system wherein the wind turbulence models from the model storage are provided in the user interface in response to an action taken by users (see page 41, 2nd paragraph and “atmosphere” block in Fig. 31).

25. As to claim 60, AeroSim discloses a computer implemented system for **designing a target system** (see "AeroSim aeronautical simulation blockset provides a complete set of tools for the rapid **development of** nonlinear 6–degree–of–freedom **aircraft dynamic models**" in page 3, col. 2, last paragraph, lines 1–3) in which an aerospace or aeronautic model is one of the elements for designing the target system, the system comprising: a model storage for storing and providing models necessary to design the target system (see "library" in page 3, col. 2, last paragraph, lines 1–3); a design unit for designing a model of the target system by utilizing the models provided

by the model storage, and a **memory** for saving a model of the target system (see "The **library** also provides complete aircraft models" in page 4, col. 2, last paragraph), wherein the model storage provides a plurality of models for equations of motion (see page 4, col. 2, last paragraph), wherein the plurality of models for equations of motion include at least one model for equations of motion with simple variable mass and at least one model for equations of motion with custom variable mass (see "1. Parameters: Initial mass = the initial value for the fuel flow integrator. Tank structure = a Matlab structure which contains the tank parameters read from the JSBSim configuration file. 2. Inputs: MassFlow = the mass fuel flow out of the tank [use negative input if the fuel flows into the tank]... 3. Outputs: Mass = current mass of the fuel in the tank" in page 177, col. 1 to page 177, col. 2, line 1) and at least one custom variable mass model (see "1. Parameters: ... Fuel flow look–up table = the mass fuel flow data as a NRPM ×NMAP matrix, given in grams per hour" in page 128, col. 1, last 2 lines and "3. Outputs: ... Fuelflow = the instantaneous mass fuel flow, in kg/s" in page 128, col. 2, lines 16, 20, and 21). Examiner notes that in the claim, "simple variable mass" was interpreted as "The variable mass includes at least one of simple variable mass in which mass changes via mass rate", since AeroSim's model incorporates mass fuel flow out of and/or into the tank, i.e. mass rate changes; and that "custom variable mass" was interpreted as "users may specify how the mass changes" (see specification's page 4, lines 8–10).

26. As to claim 61, AeroSim discloses a system further comprising an execution unit for executing the target system designed in the design unit (see page 32, 1st and 2nd paragraphs).

27. As to claim 62, AeroSim discloses a system wherein the execution unit is realized through a process of automatic code generation from the design unit (see page 32, 2nd paragraph).

28. As to claim 63, AeroSim discloses a system wherein numerical representations including data type, precision and data vectorization of the models are automatically derived from the context of using the models when executing the models (see page 32, 4th and 5th paragraphs).

29. As to claim 64, AeroSim discloses a system wherein the models for equations of motion include models for one of three–degree–of–freedom equations of motion and six–degree–of–freedom equations of motion (see page 41, lines 1–2).

30. As to claim 65, AeroSim discloses a system wherein the plurality of models for equations of motion implement in multiple axes representations (see "EOM" in page 89, lines 7–9).

31. As to claim 66, AeroSim discloses a system wherein the plurality of models for equations of motion implement in one of body axes (see " body axes" in page 89, lines 7–9) and wind axes (see page 50).

32. As to claim 67, AeroSim discloses a system wherein the models provided from the model storage are represented in symbols (see page 4, Fig. 2).

33. As to claim 68, AeroSim discloses a system wherein the symbols include blocks (see page 3, col. 2, last paragraph, lines 1–3).

34. As to claim 69, AeroSim discloses a system wherein the design unit provides a user interface to enter parameters for each block of the target system in response to an action taken by users (see page 32, 4th paragraph).

35. As to claim 70, AeroSim discloses a system wherein the user interface is provided in response to users clicking each block of the target system (see page 41, 2nd paragraph).

36. As to claim 71, AeroSim discloses a system wherein the user interface provides an option to select one of the equations of motion models in the model storage (see page 41, 2nd paragraph and “equations of motion” block in Fig. 31, as well as page 89).

37. As to claim 72, AeroSim discloses a system wherein the equations of motion models in the model storage are provided in the user interface in response to an action taken by users (see page 41, 2nd paragraph and “equations of motion” block in Fig. 31).

38. As to claim 80, AeroSim discloses a computer–readable medium holding instructions executable in a computer for the **design of a target system** (see "AeroSim aeronautical simulation blockset provides a complete set of tools for the rapid **development of** nonlinear 6–degree–of–freedom **aircraft dynamic models**" in page 3, col. 2, last paragraph, lines 1–3), wherein a planetary environment is one of factors for designing the target system, the instructions comprising: instructions for providing wind turbulence models necessary to design the target system (see page 65); wherein the wind turbulence model includes at least one discrete wind turbulence model (see

“discrete” as “3×1 VECTOR”, since AeroSim’s 3×1 vector is not continuous, in "Inputs: VelW = the 3×1 VECTOR of wind–axes velocities" and "Outputs: TurbVel = the 3×1 VECTOR of turbulence velocities" in the same AeroSim page 65); and instructions for incorporating the wind turbulence models to the target system (see page 4, col. 2, last paragraph).

39. As to claim 81, AeroSim discloses a medium further holding instructions for executing behavior of the target system designed (see page 32, 1st and 2nd paragraphs).

40. As to claim 82, AeroSim discloses a medium wherein the wind turbulence models are represented by blocks (see page 3, col. 2, last paragraph, lines 1–3).

41. As to claim 83, AeroSim discloses a medium wherein the instructions for incorporating comprises instructions for providing a graphical user interface in response to an action taken by a user (see page 32, 4th paragraph).

42. As to claim 84, AeroSim discloses a medium wherein the graphical user interface is provided in response to users clicking the blocks representing wind turbulence models (see page 41, 2nd paragraph).

43. As to claim 85, AeroSim discloses a medium wherein the graphical user interface provides an option to change a wind turbulence model to another wind turbulence model (see page 41, 2nd paragraph and “atmosphere” block in Fig. 31).

44. As to claim 86, AeroSim discloses a medium wherein the graphical user interface provides blanks to enter parameters of the wind turbulence models to produce outputs of the wind turbulence models (see page 32, 4th paragraph).

45. As to claim 87, AeroSim discloses a computer–readable medium holding instructions executable in a computer for the **design of a target system** (see "AeroSim aeronautical simulation blockset provides a complete set of tools for the rapid **development of** nonlinear 6–degree–of–freedom **aircraft dynamic models**" in page 3, col. 2, last paragraph, lines 1–3), the instructions for comprising: instructions for providing equations of motion models necessary to design the target system (see page 3, col. 2, last paragraph, lines 3–5) wherein the equations of motion models include at least one of simple variable mass models (see "1. Parameters: Initial mass = the initial value for the fuel flow integrator. Tank structure = a Matlab structure which contains the tank parameters read from the JSBSim configuration file. 2. Inputs: MassFlow = the mass fuel flow out of the tank [use negative input if the fuel flows into the tank]… 3. Outputs: Mass = current mass of the fuel in the tank" in page 177, col. 1 to page 177, col. 2, line 1) and custom variable mass models (see "1. Parameters: … Fuel flow look–up table = the mass fuel flow data as a NRPM ×NMAP matrix, given in grams per hour" in page 128, col. 1, last 2 lines and "3. Outputs: … Fuelflow = the instantaneous mass fuel flow, in kg/s" in page 128, col. 2, lines 16, 20, and 21); and instructions for incorporating the equations of motion models into the target system (see page 4, col. 2, last paragraph). Examiner notes that in the claim, "simple variable mass" was interpreted as "The variable mass includes at least one of simple variable mass in which mass changes via mass rate", since AeroSim's model incorporates mass fuel flow out of and/or into the tank, i.e. mass rate changes; and that "custom variable mass" was

interpreted as "users may specify how the mass changes" (see specification's page 4, lines 8–10).

46. As to claim 88, AeroSim discloses a medium wherein the equations of motion models include at least one of three–degree–of–freedom equations of motion models and six–degree–of–freedom equations of motion models (see page 41, lines 1–2).

47. As to claim 89, AeroSim discloses a medium further holding instructions for executing behavior of the target system designed (see page 32, 1st and 2nd paragraphs).

48. As to claim 90, AeroSim discloses a medium wherein the equations of motion models implemented in multiple axes representations (see "EOM" in page 89, lines 7–9).

49. As to claim 91, AeroSim discloses a medium wherein the equations of motion models implemented in one of body axes (see " body axes" in page 89, lines 7–9) and wind axes (see page 50).

50. As to claim 92, AeroSim discloses a medium wherein the equations of motion models are represented by blocks (see page 3, col. 2, last paragraph, lines 1–3).

51. As to claim 93, AeroSim discloses a medium wherein the instructions for incorporating comprises instructions for providing a graphical user interface in response to an action taken by a user (see page 32, 4th paragraph).

52. As to claim 94, AeroSim discloses a medium wherein the graphical user interface is provided in response to user's clicking the blocks representing the equations of motion models (see page 41, 2nd paragraph).

53. As to claim 95, AeroSim discloses a medium wherein the graphical user interface provides an option to change an equation of motion model to another equations of motion model (see page 41, 2nd paragraph and “atmosphere” block in Fig. 31).

54. As to claim 96, AeroSim discloses a medium wherein the graphical user interface provides blanks to enter parameters of the equations of motion models to produce outputs of the equations of motion models (see page 32, 4th paragraph).

Claim Rejections – 35 USC § 103

55. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

56. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

57. Claims 42–53 are rejected under 35 U.S.C. 103(a) as being unpatentable over AeroSim taken in view of Marc Rauw, (Rauw hereinafter), FDC 1.2 – A Simulink Toolbox for Flight Dynamics and Control Analysis, as applied to claim 38 above.

58. As to claim 42, while AeroSim discloses MIL–STD–8785C (see "Von Karman" in page 65, line 1), AeroSim fails to disclose incorporating a wind turbulence model from one of military specifications MIL–HDBK–1797.

59. Rauw discloses a system wherein the plurality of wind turbulence model includes a model incorporating a wind turbulence model from one of military specifications MIL–HDBK–1797 (see "MIL–HDBK–1797" as "digital Dryden" in page 57, last paragraph to page 58, 1st paragraph) and MIL–STD–8785C (see "Von Karman" in page 65, line 1 and as " Dryden" in page 118, Description, lines 1–2). As per “The specifications MIL–F–8785C and MIL–STD–1797 provide atmospheric turbulence forms including Von Karman form and Dryden form, discrete wind gust form and wind shear form. The specification MIL–STD–1797 additionally provides the digital filter implementation of the Dryden turbulence components” (see application description page 14, last paragraph), Examiner interprets "MIL–F–8785C" as "atmospheric turbulence forms including Von Karman form and Dryden form" and "MIL–HDBK–1797" as "digital filter implementation of the Dryden turbulence components".

60. AeroSim and Rauw are analogous art because they are related to flight dynamics.

61. Therefore, it would have been obvious to one of ordinary skill in this art at the time of invention by applicant to utilize the steps of Rauw in the method of AeroSim because Rauw develops the Flight Dynamics and Control toolbox FDC based upon Matlab and Simulink, as a graphical software environment for the design and analysis of aircraft dynamics and control systems (see page iii, lines 1–3), and as a result, Rauw

reports the following improvements over his prior art, i.e. flight control systems with mechanical linkages: a full authority, fly–by–wire, digital control system, i.e. an Automatic Flight Control System (AFCS), which incorporates design–techniques and mathematical dynamic models in a user–friendly Computer Assisted Control System Design (CACSD) package (see page 11, lines 3–9).

62. As to claim 43, Rauw discloses a system wherein the plurality of wind turbulence models includes wind turbulence models that are continuous in altitude (see “A major drawback of the Von Karman spectral densities is that they are not rational functions of Ω. For this reason the following power spectral density model is often used for flight simulation, i.e. Dryden spectra" in page 32, 3rd to 2nd paragraphs from the bottom).

63. As to claim 44, Rauw discloses a system wherein the plurality of wind turbulence models includes wind turbulence models at altitudes within multiple transition regions between the multiple regions for wind turbulence models (see "regions" as "steady and non–steady atmospheres" in page 235 to page 237, 1st paragraph).

64. As to claim 45, Rauw discloses a system wherein the plurality of wind turbulence models includes a wind turbulence model at an altitude in a transition region between first and second regions (see "first region" as flight, "transition" as "approach", and "second region" as "landing" in page 235, lines 1–10).

65. As to claim 46, Rauw discloses a system wherein the wind turbulence models in the first and second regions being defined in military specifications (see "military specifications" as "digital Dryden" in page 57, last paragraph to page 58, 1st paragraph, "Von Karman" in page 65, line 1 and as " Dryden" in page 118, Description, lines 1–2).

As per “The specifications MIL–F–8785C and MIL–STD–1797 provide atmospheric turbulence forms including Von Karman form and Dryden form, discrete wind gust form and wind shear form. The specification MIL–STD–1797 additionally provides the digital filter implementation of the Dryden turbulence components” (see application description page 14, last paragraph), Examiner interprets "MIL–F–8785C" as "atmospheric turbulence forms including Von Karman form and Dryden form" and "MIL–HDBK–1797" as "digital filter implementation of the Dryden turbulence components".

66. As to claim 47, Rauw discloses a system wherein the wind turbulence models within a plurality of transition regions generate values of the wind turbulence model by transition methods between the multiple regions for wind turbulence (see page 236, 3rd paragraph from the bottom, lines 2–7).

67. As to claim 48, Rauw discloses a system wherein the transition method of the wind turbulence model within a single transition region may contain a plurality of transition methods (see page 236, 3rd paragraph from the bottom, lines 2–7).

68. As to claim 49, Rauw discloses a system wherein the plurality of transition methods may overlap (see page 236, 3rd paragraph from the bottom, lines 2–7).

69. As to claim 50, AeroSim discloses a system wherein the wind turbulence model in the transition region generates values of the wind turbulence model by linearly interpolating between values of wind turbulence models between the plurality of transition regions (see page 63, col. 1, last paragraph).

70. As to claim 51, Rauw discloses a system wherein the wind turbulence model transforms coordinates of the wind turbulence model in a plurality of regions to a common coordinate system (see page 233, Section B2.2).

71. As to claim 52, Rauw discloses a system wherein the common coordinate system is the coordinates of the wind turbulence model in one of the plurality of regions (see page 237, Section B.5).

72. As to claim 53, Rauw discloses a system wherein the wind turbulence model transforms coordinates of the wind turbulence model in the first region to coordinates of the wind turbulence model in the second region (see page 237, Section B.5).

73. Claims 1, 4, 5, 7–11, 13, 16, 17, and 19–24 are rejected under 35 U.S.C. 103(a) as being unpatentable over AeroSim taken in view of Rauw, and further in view of applicant's admission of prior art (AAPA hereinafter).

74. As to claim 1, AeroSim discloses a computer–implemented method for **modeling a target system** (see "AeroSim aeronautical simulation blockset provides a complete set of tools for the rapid **development of** nonlinear 6–degree–of–freedom **aircraft dynamic models**" in page 3, col. 2, last paragraph, lines 1–3), the method comprising: identifying a first block that represents multiple **component models** in a block diagram model of a target system (see "The main library folder, shown in Fig. 31 includes sub–folders for various parts of the aircraft dynamic model. The sub–sections of the Block Reference section correspond to these library subfolders. The AeroSim library contains a total of 103 **blocks** ..." in page 41, 2nd paragraph and Figure 31); displaying a user

interface in response to a user action (see “double–click the block to open the block parameters dialog” in page 32, 4th paragraph and ***user interface/dialog box*** in Fig. 2), the user interface including a mechanism that provides the user with the multiple component models (see page 41, 2nd paragraph); incorporating the first **component model**, into the model of the target system using the first ***block*** (see “The main library folder, shown in Fig. 31 includes **sub–folders for various parts of the aircraft dynamic model**” in page 41, 2nd paragraph, lines 1–2 and ***blocks*** in Fig. 31); and saving the model of the target system that includes the first component model in a memory (see “The library also provides complete aircraft models” in page 4, col. 2, last paragraph). Examiner relies upon AeroSim’s “**blocks**” (see "The AeroSim library folders, presented in Fig. 2, provide more than one–hundred **blocks** commonly used in the development of aircraft dynamic models. These **include nonlinear equations of motion**, linear aerodynamics, piston–engine propulsion, aircraft inertia parameters, atmosphere models, Earth models, sensors and actuators, frame transformations, and pilot interfaces such as joystick input and 3–D visual output" in AeroSim page 3, col. 2, last paragraph to page 4, col. 2, 1st paragraph) to teach the limitation of "component models"; since, for example, the specification defines “The **component models include models for three–degree–of–freedom equations of motion** with variable mass and/or six–degree–of–freedom equations of motion with variable mass" (see page 5, 2nd paragraph, lines 4–6).

75. While AeroSim discloses presenting a user interface in response to an action taken by a user (see “double–click the block to open the block parameters dialog” in

page 32, 4th paragraph and user interface/dialog box in Fig. 2), AeroSim fails to disclose where the user action includes selecting the first block and receiving a user selection that selects a first component model from the multiple component models.

76. Rauw discloses displaying a user interface in response to a user action (see "the designer should be able to manipulate all elements of a specific control system, as well as the mathematical models involved in a specific design task, by means of a graphical user–interface" in page 15, lines 3–5), where the user action includes selecting the first block (see "double–clicking an INCOLOAD button within a graphical Simulink system from FDC 1.2, after which a user menu will be displayed, see figure 9.2" in page 143, last 2 lines and page 144, figure 9.2), and receiving a user selection that selects a first component model from the multiple component models (see "the designer should be able to manipulate all elements of a specific control system, as well as the mathematical models involved in a specific design task, by means of a graphical user–interface" in page 15, lines 3–5).

77. While AeroSim presents a user interface in response to an action taken by a user (see "double–click the block to open the block parameters dialog" in page 32, 4th paragraph and user interface/dialog box in Fig. 2) and switches blocks by selecting them in the user interface (see page 3, col. 2, last paragraph to page 4 and page 32, 4th paragraph) and Rauw discloses receiving a user selection that selects a first component model from the multiple component models, AeroSim and Rauw fail to specifically disclose switching the first block to represent a second component model by selecting

the second component model in the user interface without replacing the first block with a second block representing the second component model.

78. Examiner notes that AeroSim is a “computer modeling and simulation package such as Simulink”. AeroSim discloses: "AeroSim aeronautical simulation blockset provides a complete set of tools for the rapid **development of** nonlinear 6–degree–of–freedom **aircraft dynamic models**". (See page 3, col. 2, last paragraph, lines 1–3).

79. Applicant admits that it is “a standard mechanism used in computer modeling and simulation packages such as Simulink” that “upon selecting the desired component model from one of the user interfaces, the corresponding functionality of the desired component model can be included in the symbol representing the models as, for example, one of a selection of pre–built components models can be copied or referred to in the symbol”. The specification defines:

> **“Upon selecting the desired component model from one of the user interfaces depicted in FIGURES 4A through 4E, the corresponding functionality of the desired component model can be included in the symbol representing the models in a number of ways: (i) one of a selection of pre–built components models can be copied or referred to in the symbol**, (ii) the desired functionality can be included by conditionally evaluating part of a component model, and (iii) a sequence of component model modifications can be executed to arrive at the desired functionality. **The first method represents a standard mechanism used in computer modeling and simulation packages such as Simulink**.” (See page 20, last paragraph to page 21, 1st paragraph).

80. Therefore, AeroSim switches the first block to represent a second component model by selecting the second component model in the user interface without replacing the first block with a second block representing the second component model (see page 3, col. 2, last paragraph to page 4, page 32, 4th paragraph, and user interface/dialog box in Fig. 2).

81. Applicant’s modeling software, AeroSim, and Rauw are analogous art because they are related to flight dynamics.

82. Therefore, it would have been obvious to one of ordinary skill in this art at the time of invention by applicant to utilize the steps of Rauw in the method of AeroSim because Rauw develops the Flight Dynamics and Control toolbox FDC based upon Matlab and Simulink, as a graphical software environment for the design and analysis of aircraft dynamics and control systems (see page iii, lines 1–3), and as a result, Rauw reports the following improvements over his prior art, i.e. flight control systems with mechanical linkages: a full authority, fly–by–wire, digital control system, i.e. an Automatic Flight Control System (AFCS), which incorporates design–techniques and mathematical dynamic models in a user–friendly Computer Assisted Control System Design (CACSD) package (see page 11, lines 3–9).

83. As to claim 4, AeroSim discloses a method wherein the component models belong to a category of wind turbulence models that include at least a discrete turbulence model (see page 65).

84. As to claim 5, AeroSim discloses a method of claim wherein the component models belong to a category of equations of motion models that include at least one simple variable mass model (see "1. Parameters: Initial mass = the initial value for the fuel flow integrator. Tank structure = a Matlab structure which contains the tank parameters read from the JSBSim configuration file. 2. Inputs: MassFlow = the mass fuel flow out of the tank [use negative input if the fuel flows into the tank]... 3. Outputs: Mass = current mass of the fuel in the tank" in page 177, col. 1 to page 177, col. 2, line 1) and at least one custom variable mass model (see "1. Parameters: ... Fuel flow look–up table = the mass fuel flow data as a NRPM ×NMAP matrix, given in grams per hour"

in page 128, col. 1, last 2 lines and “3. Outputs: ... Fuelflow = the instantaneous mass fuel flow, in kg/s" in page 128, col. 2, lines 16, 20, and 21). Examiner notes that in the claim, “simple variable mass" was interpreted as “The variable mass includes at least one of simple variable mass in which mass changes via mass rate”, since AeroSim’s model incorporates mass fuel flow out of and/or into the tank, i.e. mass rate changes; and that “custom variable mass” was interpreted as “users may specify how the mass changes" (see specification’s page 4, lines 8–10).

85. As to claim 7, AeroSim discloses a method wherein component models provided as options of the user interface may be extended by users (see page 32, 1st and 2nd paragraphs).

86. As to claim 8, AeroSim discloses a method wherein after the second component model is selected in the user interface, the second component model is incorporated into the model of the target system through the first block (see page 32, 4th paragraph).

87. As to claim 9, AeroSim discloses a method wherein the first component model has a same configuration of external ports that can be of input or output type as the second component model (see "customized" in page 26, lines 1–4).

88. As to claim 10, AeroSim discloses a method wherein the first component model has a different configuration of external ports that can be of input or output type as the second component model (see "customized" in page 26, lines 1–4; page 35, col. 2, next to last paragraph; and "which specifies what parameters of the flight dynamics model the program will output" in page 36, col. 1, OUTPUT bullet).

89. As to claim 11, AeroSim discloses a method wherein the first block represents one of the first component model and the second component model depending on users' selection of the first component model and the second component model (see "we will specify the aircraft parameter file" in page 32, 4th paragraph).

90. As to claim 13, AeroSim discloses a computer–implemented method for **modeling a target system** (see "AeroSim aeronautical simulation blockset provides a complete set of tools for the rapid **development of** nonlinear 6–degree–of–freedom **aircraft dynamic models**" in page 3, col. 2, last paragraph, lines 1–3), the method comprising: identifying a first block that represents multiple **component models** in a block diagram model of a target system (see "The main library folder, shown in Fig. 31 includes sub–folders for various parts of the aircraft dynamic model. The sub–sections of the Block Reference section correspond to these library subfolders. The AeroSim library contains a total of 103 **blocks** ..." in page 41, 2nd paragraph); displaying a user interface in response to a user action (see "double–click the block to open the block parameters dialog" in page 32, 4th paragraph and ***user interface/dialog box*** in Fig. 2), the user interface including a mechanism that provides the user with the multiple component models (see page 41, 2nd paragraph); incorporating the first component model into the model of the target system using the block (see "The main library folder, shown in Fig. 31 includes **sub–folders for various parts of the aircraft dynamic model**" in page 41, 2nd paragraph, lines 1–2 and ***blocks*** in Fig. 31); and saving the model of the target system that includes the first component model in a memory (see "The library also provides complete aircraft models" in page 4, col. 2, last paragraph).

Examiner relies upon AeroSim's "**blocks**" (see "The AeroSim library folders, presented in Fig. 2, provide more than one–hundred **blocks** commonly used in the development of aircraft dynamic models. These **include nonlinear** **equations of motion**, linear aerodynamics, piston–engine propulsion, aircraft inertia parameters, atmosphere models, Earth models, sensors and actuators, frame transformations, and pilot interfaces such as joystick input and 3–D visual output" in AeroSim page 3, col. 2, last paragraph to page 4, col. 2, 1st paragraph) to teach the limitation of "component models"; since, for example, the specification defines "The **component models include models for three–degree–of–freedom equations of motion** with variable mass and/or six–degree–of–freedom equations of motion with variable mass" (see page 5, 2nd paragraph, lines 4–6).

91. While AeroSim discloses presenting a user interface in response to an action taken by a user (see "double–click the block to open the block parameters dialog" in page 32, 4th paragraph and user interface/dialog box in Fig. 2), AeroSim fails to disclose where the user action includes selecting the first block and receiving a user selection that selects a first component model from the multiple component models.

92. Rauw discloses displaying a user interface in response to a user action (see "the designer should be able to manipulate all elements of a specific control system, as well as the mathematical models involved in a specific design task, by means of a graphical user–interface" in page 15, lines 3–5), where the user action includes selecting the first block (see "double–clicking an INCOLOAD button within a graphical Simulink system from FDC 1.2, after which a user menu will be displayed, see figure 9.2" in page 143,

last 2 lines and page 144, figure 9.2), and receiving a user selection that selects a first component model from the multiple component models (see “the designer should be able to manipulate all elements of a specific control system, as well as the mathematical models involved in a specific design task, by means of a graphical user–interface" in page 15, lines 3–5).

93. While AeroSim presents a user interface in response to an action taken by a user (see “double–click the block to open the block parameters dialog” in page 32, 4th paragraph and user interface/dialog box in Fig. 2) and switches blocks by selecting them in the user interface (see page 3, col. 2, last paragraph to page 4 and page 32, 4th paragraph) and Rauw discloses receiving a user selection that selects a first component model from the multiple component models, AeroSim and Rauw fail to specifically disclose switching the first block to represent a second component model by selecting the second component model in the user interface without replacing the first block with a second block representing the second component model.

94. Examiner notes that AeroSim is a “computer modeling and simulation package such as Simulink”. AeroSim discloses: "AeroSim aeronautical simulation blockset provides a complete set of tools for the rapid **development of** nonlinear 6–degree–of–freedom **aircraft dynamic models**". (See page 3, col. 2, last paragraph, lines 1–3).

95. Applicant admits that it is “a standard mechanism used in computer modeling and simulation packages such as Simulink” that “upon selecting the desired component model from one of the user interfaces, the corresponding functionality of the desired component model can be included in the symbol representing the models as, for

example, one of a selection of pre–built components models can be copied or referred to in the symbol". The specification defines:

> **"Upon selecting the desired component model from one of the user interfaces depicted in FIGURES 4A through 4E, the corresponding functionality of the desired component model can be included in the symbol representing the models in a number of ways: (i) one of a selection of pre–built components models can be copied or referred to in the symbol**, (ii) the desired functionality can be included by conditionally evaluating part of a component model, and (iii) a sequence of component model modifications can be executed to arrive at the desired functionality. **The first method represents a standard mechanism used in computer modeling and simulation packages such as Simulink**." (See page 20, last paragraph to page 21, 1st paragraph).

96. Therefore, AeroSim switches the first block to represent a second component model by selecting the second component model in the user interface without replacing the first block with a second block representing the second component model (see page 3, col. 2, last paragraph to page 4, page 32, 4th paragraph, and user interface/dialog box in Fig. 2).

97. As to claim 16, AeroSim discloses a method wherein the component models belong to a category of wind turbulence models that include at least a discrete turbulence model (see page 65).

98. As to claim 17, AeroSim discloses a method wherein the component models belong to a category of equations of motion models that include at least one simple variable mass model and at least one custom variable mass model (see "current mass of the fuel in the tank" in page 177, col. 2, line 1).

99. As to claim 19, AeroSim discloses a method wherein component models provided as options of the user interface may be extended by users (see page 32, 1st and 2nd paragraphs).

100. As to claim 20, AeroSim discloses a method wherein after the second component is selected in the user interface, the second component model is incorporated into the model of the target system through the first block (see page 32, 4^{th} paragraph).

101. As to claim 21, AeroSim discloses a method wherein the first component model has a same configuration of external ports that can be of input or output type as the second component model (see "customized" in page 26, lines 1–4).

102. As to claim 22, AeroSim discloses a method wherein the first component model has a <u>different configuration of external ports</u> that can be of input or output type as the second component model (see "customized" in page 26, lines 1–4; page 35, col. 2, next to last paragraph; and "which specifies <u>what parameters of the flight dynamics model the program will output</u>" in page 36, col. 1, **OUTPUT** bullet).

103. As to claim 23, AeroSim discloses a method wherein the first block represents one of the first component model and the second component model depending on users' selection of the first component model and the second component model (see "we will specify the aircraft parameter file" in page 32, 4^{th} paragraph).

104. As to claim 24, AeroSim discloses a method wherein the first component model is switched to the second component model without replacing the first block by a second block representing the second component model (see page 32, 4^{th} paragraph).

105. Claims 3 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over AeroSim taken in view of Rauw, further in view of AAPA, and further in view of Douglas K. Hiranaka, (Hiranaka hereinafter), An Integrated, Modular Simulation System for Education and Research as applied to claims 1 and 13 above.

106. As to claim 3, while AeroSim discloses a computer–implemented method for **modeling a target system** (see "AeroSim aeronautical simulation blockset provides a complete set of tools for the rapid **development of** nonlinear 6–degree–of–freedom **aircraft dynamic models**" in page 3, col. 2, last paragraph, lines 1–3) and Rauw discloses a graphical software environment for the design and analysis of aircraft dynamics and control systems (see page iii, lines 1–3), AeroSim and Rauw fail to disclose a non standard day atmosphere model.

107. Hiranaka discloses component models belonging to a category of atmosphere models that include at least a non standard day atmosphere model (see pages 64-66 and more specifically "The block takes in as parameters the sea level temperature and pressure. This allows the user to set up **<u>nonstandard</u>** conditions to match flight test data that has not been normalized" in page 65, 1st paragraph).

108. Applicant's modeling software, AeroSim, Rauw, and Hiranaka are analogous art because they are related to flight dynamics.

109. Therefore, it would have been obvious to one of ordinary skill in this art at the time of invention by applicant to utilize the non standard day atmosphere model of Hiranaka in the AeroSim–Rauw method because Hiranaka creates Simulink driver blocks for Cal Poly's simulator (see page 82), and as a result, Hiranaka reports the following improvement over his prior art: rapid design, analysis, and testing of aircraft and components. Various configurations can be rapidly created by substituting more complex input/output blocks and more complex feedback architectures as well as creating more complete instrument setups from a basic model. The engineer creates

the block diagrams in Simulink representing the flight control system and bare-airframe model, then adds the stick and instrument blocks. The compiled C–code representing the block diagrams is ready for immediate pilot-in-the-loop and or hardware in the loop simulation. Innovative and new aircraft can be rapidly loaded and flown in a variety of configurations. High level accurate models of fly by wire flight control systems can be created and tested on a desktop. (See page 82).

110. As to claim 15, Hiranaka discloses component models belonging to a category of atmosphere models that include at least a non standard day atmosphere model (see pages 64-66 and more specifically “The block takes in as parameters the sea level temperature and pressure. This allows the user to set up **nonstandard** conditions to match flight test data that has not been normalized“ in page 65, 1st paragraph).

111. Claims 25–37 and 73–79 are rejected under 35 U.S.C. 103(a) as being unpatentable over AeroSim taken in view of Hiranaka.

112. As to claim 25, AeroSim discloses a computer implemented system for **designing a target system** (see "AeroSim aeronautical simulation blockset provides a complete set of tools for the rapid **development of** nonlinear 6–degree–of–freedom **aircraft dynamic models**" in page 3, col. 2, last paragraph, lines 1–3) in which a planetary environment is one of the factors for designing the target system, the system comprising: a model storage for storing and providing models necessary to design the target system (see "library" in page 3, col. 2, last paragraph, lines 1–3); a design unit for designing the target system by utilizing the models provided by the model storage (see

page 4, col. 2, last paragraph); and a **memory** for saving a model of the target system (see “The **library** also provides complete aircraft models” in page 4, col. 2, last paragraph).

113. While AeroSim discloses a computer–implemented method for **modeling a target system** (see "AeroSim aeronautical simulation blockset provides a complete set of tools for the rapid **development of** nonlinear 6–degree–of–freedom **aircraft dynamic models**" in page 3, col. 2, last paragraph, lines 1–3), AeroSim fails to disclose a non standard day atmosphere model.

114. Hiranaka discloses component models belonging to a category of atmosphere models that include at least a non standard day atmosphere model (see pages 64-66 and more specifically “The block takes in as parameters the sea level temperature and pressure. This allows the user to set up **nonstandard** conditions to match flight test data that has not been normalized“ in page 65, 1st paragraph).

115. AeroSim and Hiranaka are analogous art because they are related to flight dynamics.

116. Therefore, it would have been obvious to one of ordinary skill in this art at the time of invention by applicant to utilize the non standard day atmosphere model of Hiranaka in the AeroSim method because Hiranaka creates Simulink driver blocks for Cal Poly’s simulator (see page 82), and as a result, Hiranaka reports the following improvement over his prior art: rapid design, analysis, and testing of aircraft and components. Various configurations can be rapidly created by substituting more complex input/output blocks and more complex feedback architectures as well as

creating more complete instrument setups from a basic model. The engineer creates the block diagrams in Simulink representing the flight control system and bare-airframe model, then adds the stick and instrument blocks. The compiled C–code representing the block diagrams is ready for immediate pilot-in-the-loop and or hardware in the loop simulation. Innovative and new aircraft can be rapidly loaded and flown in a variety of configurations. High level accurate models of fly by wire flight control systems can be created and tested on a desktop. (See page 82).

117. As to claim 26, AeroSim discloses a system further comprising an execution unit for executing the target system designed in the design unit (see page 32, 1st and 2nd paragraphs).

118. As to claim 27, AeroSim discloses a system wherein the execution unit is realized through a process of automatic code generation from the design unit (see page 32, 2nd paragraph).

119. As to claim 28, AeroSim discloses a system wherein numerical representations of the models including data type, precision and data vectorization of the models are automatically derived from the context of using the models when executing the models (see page 32, 4th and 5th paragraphs).

120. As to claim 29, Hiranaka discloses a system wherein the non–standard day atmosphere model includes a model incorporating a non–standard day atmosphere from one of military standard specifications MIL–HDBK–310 and MIL–STD–210C (see pages 64-66 and more specifically "The block takes in as parameters the sea level

temperature and pressure. This allows the user to set up **nonstandard** conditions to match flight test data that has not been normalized" in page 65, 1st paragraph).

121. Claim 29, has been given a broad reasonable interpretation by the Examiner. The Examiner notes that the implementation disclosed in (pages 64-66) is functionally equivalent to the results produced by the implementation expressly claimed in Applicant's dependent claim 29. Therefore, the "product" that is produced by performing the implementation disclosed in dependent claim 29 is the functional equivalent of the "product" that is produced in (pages 64-66). Although the "implementation" by which the end result is different, the final result for the "implementation" is identical.

122. As to claim 30, AeroSim discloses a system wherein the model storage includes standard atmosphere models (see page 3, col. 2, last line).

123. As to claim 31, AeroSim discloses a system wherein the standard atmosphere model includes a Committee on Extension to the Standard Atmosphere (COESA) atmosphere model (see page 3, col. 2, last line).

124. Claim 31, has been given a broad reasonable interpretation by the Examiner. The Examiner notes that the implementation disclosed in (page 3, col. 2, last line) is functionally equivalent to the results produced by the implementation expressly claimed in Applicant's dependent claim 31. Therefore, the "product" that is produced by performing the implementation disclosed in dependent claim 31 is the functional equivalent of the "product" that is produced in (page 3, col. 2, last line). Although the "implementation" by which the end result is different, the final result for the "implementation" is identical.

125. As to claim 32, AeroSim discloses a system wherein the models provided from the model storage are represented in symbols (see page 4, Fig. 2).

126. As to claim 33, AeroSim discloses a system wherein the symbols include blocks (see page 3, col. 2, last paragraph, lines 1–3).

127. As to claim 34, AeroSim discloses a system wherein the design unit provides a user interface to enter parameters for each block of the target system in response to an action taken by users (see page 32, 4th paragraph).

128. As to claim 35, AeroSim discloses a system wherein the user interface is provided in response to users clicking each block of the target system (see page 41, 2nd paragraph).

129. As to claim 36, AeroSim discloses a system wherein the user interface provides an option to select one of the atmosphere models in the model storage (see page 41, 2nd paragraph and “atmosphere” block in Fig. 31).

130. As to claim 37, AeroSim discloses a system wherein the atmosphere models in the model storage are provided in the user interface in response to an action taken by users (see page 41, 2nd paragraph and “atmosphere” block in Fig. 31, as well as page 62).

131. As to claim 73, AeroSim discloses a computer–readable medium holding instructions executable in a computer for the **design of a target system** (see "AeroSim aeronautical simulation blockset provides a complete set of tools for the rapid **development of** nonlinear 6–degree–of–freedom **aircraft dynamic models**" in page 3, col. 2, last paragraph, lines 1–3), wherein a planetary environment is one of the factors

for designing the target system, the instructions comprising: instructions for providing atmosphere models necessary to design the target system (see "library" in page 3, col. 2, last paragraph, lines 1–3); and instructions for incorporating the atmosphere models to the target system (see page 4, col. 2, last paragraph). Hiranaka discloses component models belonging to a category of atmosphere models that include at least a non standard day atmosphere model (see pages 64-66 and more specifically “The block takes in as parameters the sea level temperature and pressure. This allows the user to set up **nonstandard** conditions to match flight test data that has not been normalized“ in page 65, 1st paragraph).

132. As to claim 74, AeroSim discloses a medium further holding instructions for executing behavior of the target system designed (see page 32, 1st and 2nd paragraphs).

133. As to claim 75, AeroSim discloses a medium wherein the atmosphere models are represented by blocks (see page 3, col. 2, last paragraph, lines 1–3).

134. As to claim 76, AeroSim discloses a medium wherein the instructions for incorporating comprises instructions for providing a graphical user interface in response to an action taken by a user (see page 32, 4th paragraph).

135. As to claim 77, AeroSim discloses a medium wherein the graphical user interface is provided in response to users clicking the blocks representing atmospheric models (see page 41, 2nd paragraph).

136. As to claim 78, AeroSim discloses a medium wherein the graphical user interface provides an option to change an atmosphere model to another atmosphere model (see page 41, 2nd paragraph and "atmosphere" block in Fig. 31).

137. As to claim 79, AeroSim discloses a medium wherein the graphical user interface provides blanks to enter parameters of the atmosphere models to produce outputs of the atmosphere models (see page 32, 4th paragraph).

138. Examiner would like to point out that any reference to specific figures, columns and lines should not be considered limiting in any way, the entire reference is considered to provide disclosure relating to the claimed invention.

Response to Arguments

139. Applicant's arguments filed 4/17/08 have been fully considered but they are not persuasive.

140. Regarding the claim objections, the amendment corrected all deficiencies and the objections are withdrawn.

141. Regarding the rejection under 103. Applicant's arguments have been considered, but they are not persuasive.

142. As to claims 1 and 13, Applicant argues, (see page 17, 2nd–3rd paragraphs, page 18, 2nd–4th paragraphs, page 22, and page 23, 1st paragraph), that AeroSim and Rauw fail to teach "switching the first block to represent a second component model", "switching the first component model to the second component model without replacing the first block by a second block representing the second component model", "switching

the first block to represent a second component model by selecting the second component model in the user interface" and "incorporating the second component model into the model of the target system by one of copying or referring to the second component model in the block, conditionally evaluating at least a part of the component model, or executing a sequence of modifications to the component model".

143. Examiner disagrees.

144. Applicant admits that it is "a standard mechanism used in computer modeling and simulation packages such as Simulink" that "upon selecting the desired component model from one of the user interfaces, the corresponding functionality of the desired component model can be included in the symbol representing the models as, for example, one of a selection of pre–built components models can be copied or referred to in the symbol". The specification defines:

145. **Upon selecting the desired component model from one of the user interfaces depicted in FIGURES 4A through 4E, the corresponding functionality of the desired component model can be included in the symbol representing the models in a number of ways: (i) one of a selection of pre–built components models can be copied or referred to in the symbol**, (ii) the desired functionality can be included by conditionally evaluating part of a component model, and (iii) a sequence of component model modifications can be executed to arrive at the desired functionality. **The first method represents a standard mechanism used in computer modeling and simulation packages such as Simulink**. (See page 20, last paragraph to p21, 1st paragraph).

146. AeroSim is a "computer modeling and simulation package such as Simulink". AeroSim discloses: "AeroSim aeronautical simulation blockset provides a complete set of tools for the rapid **development of** nonlinear 6–degree–of–freedom **aircraft dynamic models**". (See page 3, col. 2, last paragraph, lines 1–3).

147. Therefore it is the Examiner's position that AeroSim discloses "switching the first block to represent a second component model", "switching the first component model to the second component model without replacing the first block by a second block

representing the second component model", "switching the first block to represent a second component model by selecting the second component model in the user interface" and "incorporating the second component model into the model of the target system by one of copying or referring to the second component model in the block, conditionally evaluating at least a part of the component model, or executing a sequence of modifications to the component model".

148. As to claim 1, Applicant argues, (see page 18, 3rd paragraph), that AeroSim and Rauw fail to teach "multiple component models" and that "a block is not the same as a component model. The present amendment clarifies this by referring separately to a "block" and a "component model". Various locations in the application description define the meaning of "component models", but most importantly:

> "The system includes a model storage for storing and providing component models necessary to design the target system. The **component models** include non–standard day atmosphere models. The system also includes a design unit for designing the target system by utilizing the models provided by the model storage. The design unit provides a user interface to select an atmosphere model from the models in the model storage" (page 4, 4th paragraph).
> "FIGURE 2A is an exemplary computer display showing the categories of aerospace and aeronautic **component models** provided from the model storage depicted in FIGURE IA" (page 6, 5th paragraph).
> "FIGURE 2A is an exemplary computer display 210 showing the categories of aerospace and aeronautic **component models** provided from the model storage 110 in the illustrative embodiment of the present invention. The **models** provided from the model storage 110 **are** used in the development of aerospace or aeronautic system and **classified into categories according to the functions that the models perform**. The **models are categorized into planetary environment** models 211, **equations of motion models** 212, **aerodynamics models** 213, propulsion models 214, actuator models 215, etc. The **planetary environment models 211 include atmosphere models** 216, wind models 218, gravity models 217. The atmosphere models and wind models are described below in more detail with reference to FIGURES 2B and 2C, respectively" (page 12, 2nd paragraph).

149. Examiner notes that Applicant's FIGURE 2A is compatible with AeroSim's Fig. 1 in page 4.

150. AeroSim teaches "multiple component models" and refers separately to "**blocks**" and "**<u>component models</u>**". (See "1.8 Library Description. The AeroSim library folders, presented in Fig. 2, provide more than one-hundred **blocks commonly used in the development of <u>aircraft dynamic models</u>**. These include nonlinear **<u>equations of motion</u>**, linear **<u>aerodynamics</u>**, piston-engine propulsion, aircraft inertia parameters, **<u>atmosphere models</u>** ..." in page 3, col. 2, last paragraph).

151. As to claims 4, 38, 39–41, 42–53, 54–59, and 80–86, Applicant argues, (see page 20, 1st–3rd paragraphs, page 25, 3rd–last paragraphs, page 27, last 3 paragraphs, and page 28, 1st–3rd paragraphs), that Rauw fails to teach "a discrete wind turbulence model" and that the "AeroSim manual, however, is silent about whether the turbulence block represents a discrete wind turbulence model or a continuous wind turbulence model". First of all, Applicant did not elaborate "discrete" in the Application description. As pointed out in the previous rejection, Examiner relies upon AeroSim's "3×1 VECTOR" (see "Inputs: VelW = the 3×1 VECTOR of wind–axes velocities" and "Outputs: TurbVel = the 3×1 VECTOR of turbulence velocities" in the same AeroSim page 65) to teach the limitation of "discrete", since AeroSim's 3×1 vector is not continuous. As pointed out in the instant rejection (see Claim Interpretation above), and the previous rejection (paragraph 4), "In the absence of an elaboration of 'discrete' in the Application description, the claims reciting 'a discrete wind turbulence model' were interpreted according to this dictionary definition (American Heritage® Dictionary of the English Language): *Mathematics* Defined for a finite or countable set of values; not

continuous”. Second, there is no difference between the dictionary’s definition of “discrete” (not continuous) and AeroSim’s 3×1 vector, which is not continuous. The Examiner would like to point out that the Examiner, throughout the prosecution of this application, applied art in accordance with the guidance set forth in MPEP § 2131, "The elements must be arranged as required by the claim, but this is not an ipsissimis verbis test, i.e., identity of terminology is not required".

152. As to claims 5, 60–72 and 87–96; Applicant argues, (see page 20, 4th–5th paragraphs, page 20, 1st–2nd paragraphs, page 26, page 28, last 3 paragraphs, and page 29), that AeroSim fails to teach "wherein the component models belong to a category of equations of motion models that include at least one simple variable mass model **and** at least one custom variable mass model”. Examiner has further elaborated such disclosures in the instant rejection as follows: AeroSim discloses a method of claim wherein the component models belong to a category of equations of motion models that include at least one simple variable mass model (see "1. Parameters: Initial mass = the initial value for the fuel flow integrator. Tank structure = a Matlab structure which contains the tank parameters read from the JSBSim configuration file. 2. Inputs: MassFlow = the mass fuel flow out of the tank [use negative input if the fuel flows into the tank]… 3. Outputs: Mass = current mass of the fuel in the tank" in page 177, col. 1 to page 177, col. 2, line 1) and at least one custom variable mass model (see "1. Parameters: … Fuel flow look–up table = the mass fuel flow data as a NRPM ×NMAP matrix, given in grams per hour” in page 128, col. 1, last 2 lines and “3. Outputs: …

Fuelflow = the instantaneous mass fuel flow, in kg/s" in page 128, col. 2, lines 16, 20, and 21). Examiner notes that in the claim, “simple variable mass" was interpreted as “The variable mass includes at least one of simple variable mass in which mass changes via mass rate”, since AeroSim’s model incorporates mass fuel flow out of and/or into the tank, i.e. mass rate changes; and that “custom variable mass” was interpreted as “users may specify how the mass changes" (see specification’s page 4, lines 8–10). Examiner stated at the end of the rejection that specific figures, columns and lines should not be considered limiting to reference in any way. Therefore it is the Examiner's position that taking the entire reference, the art supports the rejection of the claims and the rejection is maintained.

Conclusion

153. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

154. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

155. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Juan C. Ochoa whose telephone number is (571) 272–2625. The examiner can normally be reached on 7:30AM – 4:00 PM.

156. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Rodriguez can be reached on (571) 272–3753. The fax phone number for the organization where this application or proceeding is assigned is 571–273–8300.

157. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair–direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866–217–9197 (toll–free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800–786–9199 (IN USA OR CANADA) or 571–272–1000.

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/J. C. O./ 7/24/08

Examiner, Art Unit 2123

/Paul L Rodriguez/

Supervisory Patent Examiner, Art Unit 2123